



JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY
SCHOOL OF SPATIAL PLANNING
UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF ARTS IN
SPATIAL PLANNING, BACHELOR OF SCIENCE IN WATER RESOURCE AND
ENVIRONMENTAL MANAGEMENT, BACHELOR OF PUBLIC HEALTH, BACHELOR
OF SCIENCE COMMUNITY HEALTH AND DEVELOPMENT, BACHELOR OF SCIENCE
IN RENEWABLE ENERGY AND BACHELOR OF SCIENCE IN ICT
SEMESTER 2016/2017 ACADEMIC YEAR

CENTRE: MAIN CAMPUS

COURSE CODE: PES 3211

COURSE TITLE: GEOGRAPHIC INFORMATION SYSTEMS

EXAM VENUE: STREAM: SPATIAL PLANNING

DATE: EXAM SESSION:

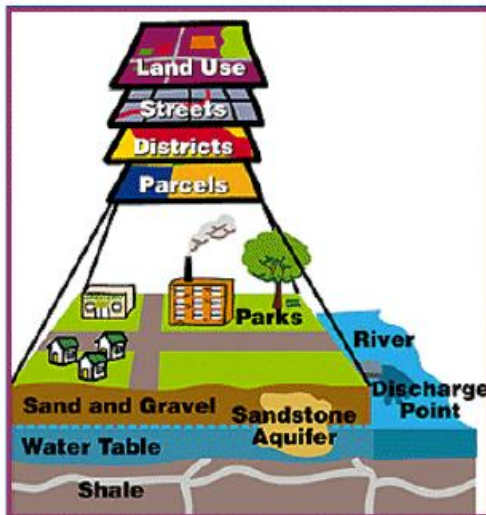
TIME: 2 HOURS

Instructions:

- 1. Answer question 1 (compulsory) and ANY other 2 questions.**
- 2. Candidates are advised not to write on the question paper.**
- 3. Candidates must hand in their answer booklets to the invigilator while in the examination room.**

Question One

- a) Describe the following concepts in relation to Geographic information Systems (GIS).
- i. Vector data (2 marks)
 - ii. Raster data (2 marks)
 - iii. Data capture (2 marks)
 - iv. Topology (2 marks)
 - v. Map projections (2 marks)
- b) GIS components are not the same as GIS functions. Explain. (10 marks)
- c) GIS is applicable in diverse areas. Discuss (6 marks)
- d) Explain the diagram below in relation to GIS data. (4 marks)



Question Two

- a) “A spatial database holds a digital representation of the real world. Among spatial data models, we can distinguish two major types, field and object-based models”. Giving appropriate examples, describe the object-based model and field-based model in GIS. (8 marks)
- b) Identify editing error in vector data captured through on-screen vectorization. (6 marks)

- c) Discuss the application of arc/node structure in vector data storage and representation. (6 marks)

Question Three

- a) With the aid of sketches, differentiate between vector data structure and raster data structure (6 marks)
- b) Universal Traverse Mercator (UTM) projection is most appropriate for Kenya. Explain. (4 marks)
- c) Discuss basic map elements in map production (10 marks)

Question Four

- a) Outline GIS analysis procedure. (6 marks)
- b) Discuss GIS analysis by types and rationale for each analysis. (14 marks)

Question Five

- a) You are commissioned to select urban areas for specific project based on its key attributes in Kenya. List spatial data and attribute data that you will collect. (10 marks)
- b) Describe advantages of relational database in modeling attribute data. (4 marks)
- c) Outline the functions of ArcMap and ArcCatalogue in ArcGIS. (6 marks)